REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-4, 6, 10-18 and 20-22 are pending, with claims 1 2, and 15 amended by the present amendment. Claims 1 and 15 are independent.

In the Official Action, claims 1-4, 6, 10-11, 13-18 and 20 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hanamura (U.S. Patent Pub. No. 2001/0033619) and Zimmermann (U.S. Patent No. 7,120,168); claims 12 and 21-22 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hanamura, Zimmermann and Official Notice; claims 1-4, 6, 10-11, 13-18 and 20 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hanamura (U.S. Patent Pub. No. 2001/0033619) and Kato (U.S. Patent No. 7,088,725); claims 12 and 21-22 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hanamura, Kato and Official Notice; claims 1-4, 6, 10-11, 13-18 and 20 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hanamura (U.S. Patent Pub. No. 2001/0033619) and Lyons (U.S. Patent No. 6,061,399); and claims 12 and 21-22 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hanamura, Lyons and Official Notice.

Claims 1 and 15 are amended to more clearly describe and distinctly claim Applicant's invention. Support for this amendment is found in Applicant's originally filed specification.[1] No new matter is added.

Briefly recapitulating, amended claim 1 is directed to:

> A method for transcoding an audio/video (A/V) stream, the method comprising:

[1] Specification, page 8, lines 12-24.

dividing a compressed digital A/V stream into audio and video data;

transcoding the divided video data to a specified format;

synchronizing the divided audio data with the transcoded video data by matching Presentation Time Stamps (PTSs) of the audio and video data; and

packetizing the synchronized audio and video data into a digital A/V stream,

wherein the step of transcoding includes transcoding only the video data, and not transcoding the audio data, and

wherein the step of synchronizing includes generating a new PTS value for the transcoded video data and generating a PTS value for the divided audio data based on the new PTS value for the transcoded video data.

Hanamura describes a device configured to synchronize audio and video bit streams between input and output MPEG-2 transport steams on the basis of synchronous information element contained in the input MPEG-2 transport streams. The device of Hanamura is configured to establish a rate control method for controlling output bit rate of video bit streams in the variable bit rate.

Fig. 1 of Hanamura describes a rate converter 600 that includes a MPEG-2 transport stream demultiplexer 610, a MPEG-2 transport stream multiplexer 620, a MPEG-2 video transcoder 640, and a system controller 650. The MPEG-2 TS demultiplexer 610 demultiplex an inputted MPEG-2 transport streams into a video TS (transport stream), an audio TS, and a system information TS. The MPEG-2 video transcoder 640 transcodes the input video TS, and outputs a video TS having a number of bits less than that of the inputted video TS.

Rate converter 700 in Fig. 2 of Hanamura is a schematic block diagram of a rate converter configured to synchronize the <u>output video</u> bit streams with the <u>input video</u> bit streams on the basis of PTS and DTS contained in the input MPEG-2 transport streams. Rate converter 700 synchronizes the output <u>video</u> bit streams with the input <u>video</u> bit streams by: (a) decoding

the video PES (Packetized Elementary Stream) into the video ES (Elementary Stream), the corresponding PTS, the corresponding DTS (Decoding Time Stamp) and other information; and (b) temporally storing the PTS (Presentation Time Stamp) and the DTS.

Rate converter 700 also generates the output video PES from the transcoded video ES, the corresponding PTS, the corresponding DTS, and the other information element so that the PTSs and the DTSs in the input video elementary streams of the video bit streams contained in the input MPEG-2 transport streams are matched with those in the corresponding video elementary streams of the output video bit streams contained in the output MPEG-2 transport streams as well as the PTSs and the DTSs in the audio frames of the audio bit streams contained in the input MPEG-2 transport streams are matched with those in the corresponding audio frames of the audio bit streams contained in the output MPEG-2 transport streams.

Cited paragraph [0325] of Hanamura describes that the PTS (i), DTS (i) and PTS_DTS_flag (i) inputted from the video PES packet decoder 242 are attached to the PES header of the corresponding picture i as the synchronization information elements PTS, DTS, and PTS_DTS_flag so as to ensure that the bit streams which have been transcoded and thus compressed will be synchronized with the bit streams which have not been transcoded nor compressed. However, this paragraph does not describe "assigning a new PTS value to a packet of the audio data by assigning a PTS value for the divided audio data based on a PTS value for the transcoded video data."

Paragraphs [0438]-[0439] of Hanamura describe the difference between last_PTS and PCR_current_audio is compared with the difference between the passing time of the audio TS packet in the input MPEG-2 transport streams and the passing time of the audio TS packet in the output MPEG-2 transport streams in accordance with the equation as follows:

PCRcurrent__audio - last__PTS < audio__th (equation (60)), where audio_th is the difference between the passing time of the audio TS packet in the input MPEG-2 transport streams and the passing time of the audio TS packet in the output MPEG-2 transport streams and is computed as follows: 25 audio_ th = {[((TSB in/TSB out) - 1) x 188 x 8]/TSB in} x 27000000 (equation (61)).

However, as acknowledged by the Official Action, Hanamura does not disclose or suggest "assigning a new PTS value to a packet of the audio data by assigning a PTS value for the divided audio data based on a PTS value for the transcoded video data." To cure this deficiency, the Official Action applies, in the alternative, Zimmermann, Kato and Lyons.

Zimmermann describes a method for performing a data synchronization procedure. The method includes: recovering elementary bitstreams with a demultiplexer that also extracts timestamps corresponding to the elementary bitstreams; decoding the elementary bitstreams with one or more decoders to produce decoded frames; processing the decoded frames to produce processed frames; and performing an output timing resynchronization procedure to align output frame timings of the processed frames according to the output timestamps. The one or more elementary bitstreams include a video bitstream and an audio bitstream.

Cited Fig. 8 of Zimmermann is flow chart where, in step 814, a system user may preferably select a different program for receiver 130. Then, in step 818, receiver 130 searches for the selected program. In step 822, a demux module 224 of receiver 130 demultiplexes the selected program to produce elementary streams (for example, a video bitstream and an audio bitstream), ***and extracts video decode timestamps 226 and audio decode timestamps 228*** (for example, the DTS discussed in conjunction with FIG. 3 of Zimmermann) and ***video output timestamps 230 and audio output timestamps 232*** (for example, the PTS discussed above in

conjunction with FIG. 3). In step 826, input controller 212 instructs video decoder 216 or audio decoder 218 to generate a decoded frame when a particular respective corresponding DTS equals the system time clock 116. In step 830, receiver 130 then writes the decoded frame to a corresponding buffer 234(b) or 236(b) (FIG. 3). The FIG. 8 process then returns to step 822 and continues to produce additional decoded frames.

In step 834 of Zimmermann, output controller 214 determines ***whether the output frame timings of video output module 220 and audio output module 222 are aligned to the current video output timestamps 230 and current audio output timestamps 232.*** If the output frame timings are aligned in step 838, then the FIG. 8 process advances to step 842. However, if the output frame timings are not aligned, then, as discussed above in conjunction with FIG. 6, ***output controller 214 resynchronizes the output frame timings in accordance with the current video output timestamps 230 and current audio output timestamps 232.***

However, Zimmermann does not disclose or suggest a) a step of transcoding that includes transcoding only the video data, and not transcoding the audio data; and b) a step of synchronizing that includes generating a new PTS value for the transcoded video data and generating a PTS value for the divided audio data based on the new PTS value for the transcoded video data. That is, in Zimmermann, audio frame timings are aligned with audio time stamps, not video time stamps. Furthermore, Zimmermann does not transcode only the video data, and not transcode the audio data. Thus, for two reasons, the combination of Hanamura and Zimmermann does not disclose or suggest all features of amended claim 1.

Kato describes a transcoding method for generating, from a first multiplexed stream, a second multiplexed stream. The method includes: separating a first elementary stream from the first multiplexed stream; converting a first signal including the first elementary stream to a

second signal; packetizing the second signal to generate a first packet; storing timing information indicating a time at which a second packet appears in the first multiplexed stream relative to the first packet; and multiplexing, based on the timing information, the first packet generated at the packetizing step and the second packet containing the second elementary stream to generate the second multiplexed stream.

Cited Fig. 6 of Kato is a method where, at step S1, the controller 19 judges, based on the timing information and PCR supplied from the TS packet timing manager 18, whether the present time (elapsed from a time when the video TS packet separator 10 was supplied with TS) is a time to provide non-video TS packets on the time base of the TS. If it determines that now is not any time to provide the non-video TS packet, the method goes to step S2. At step S2, the controller 19 judges whether the TS packet generator 15 has been supplied with an encoded video signal to be TS-packetized from the MPEG encoder 14. If controller 19 determines that the encoded video signal to be TS-packetized is not supplied, the method goes to step S3. At step S3, the TS packet generator 15 is controlled by the controller 19 to packetize the encoded video signal from the MPEG video encoder 14 and provide the packetized signal to the input terminal "a" of the switch 16. The switch 16 is controlled by the controller 19 to turn an output thereof to the input terminal "a" and provide a video TS packet supplied from the TS packet generator 15 to the downstream bit stream parser 20 shown in FIG. 4. At step S5, the controller 19 judges whether all TS packets have been provided to the stage downstream of the switch 16. If controller 19 determines that all the TS packets have not yet been provided, the method goes back to step S1. If it is determined at step S1 that the present time is a time to provide the non-video TS packet, the controller 19 will go to step S4. At step S4, the switch 16 is controlled by the controller 19 to turn the output thereof to the input terminal "b" and provide the non-video

TS packet supplied from the TS packet buffer 17 to the bit stream purser 20 located downstream of the switch 16.

However, like Zimmermann, Kato does not disclose or suggest a) a step of transcoding that includes transcoding only the video data, and not transcoding the audio data; and b) a step of synchronizing that includes generating a new PTS value for the transcoded video data and generating a PTS value for the divided audio data based on the new PTS value for the transcoded video data.

Lyons describes a method of processing at least one compressed image stream to produce a compressed output information stream, each compressed information stream representing a respective sequence of compressed image frames, the output information stream being processed to avoid decoder buffer underflow and overflow conditions. The method includes: providing a buffered information stream; processing the buffered information stream by a frame sequence adjuster to form a processed information stream; deleting at least one information frame in response to an input buffer utilization level exceeding a first threshold level; calculating a utilization level of a decoder buffer receiving the buffered information stream to provide a first calculated utilization level; deleting, using the frame sequence adjuster, at least one information frame from the buffered information stream in response to the calculated utilization level exceeding a second threshold level; and adding, using the frame sequence adjuster, at least one information frame to the buffered information stream in response to said calculated utilization level being below a third threshold level.

Cited Fig. 1 of Lyons is a block diagram of an information processing system 100. A transport stream decoder 110 decodes an input transport stream that is asynchronous to a 27 Mhz studio reference (station clock), illustratively a remote feed, to produce a program stream. The

program stream includes a plurality of packetized elementary streams (PES). A PES demultiplexer 120 demultiplexes the program stream to produce either a plurality of elementary PES streams or transport packetized PES streams including an audio stream S1A and a video stream S1V. The PES streams S1A, S1V include timing information such as presentation time stamps (PTS) and decode time stamps (DTS) that are asynchronous with respect to the 27 MHz station clock S10. The video and audio PES streams S1V, S1A are coupled to, respectively, video frame synchronizer 200 and audio processor 201.

In response to a control signal (not shown), a PES switcher 130 selects and couples one pair of video and audio packetized elementary streams S4PV, S4PA to respective video and audio retiming units 300V, 300A. The video retiming unit 300V will be described more fully below with respect to FIG. 3. The video retiming unit 300V decodes and retimes the old presentation time stamps (PTS) and decode time stamps (DTS) of the video stream using new timing information derived from a Program Clock Reference Base (PCRB) signal S9. Audio retiming unit 300A retimes the old PTS of the audio stream using new timing information derived from a Program Clock Reference Base (PCRB) signal S9. The video and audio retiming units 300V, 300A produce, respectively, a retimed video stream S7PV and a retimed audio stream S7PA.

However, like Zimmermann and Kato, Lyons does not disclose or suggest a) a step of transcoding that includes transcoding only the video data, and not transcoding the audio data; and b) a step of synchronizing that includes generating a new PTS value for the transcoded video data and generating a PTS value for the divided audio data based on the new PTS value for the transcoded video data.

As none of the cited art, individually or in combination, disclose or suggest at least the above-noted features of independent claims 1 and 15, Applicant submits the inventions defined by claims 1 and 15, and all claims depending therefrom, are not rendered obvious by the asserted references for at least the reasons stated above.

MPEP 2141 notes that prior art is not limited just to the references being applied, but includes the understanding of one of ordinary skill in the art. MPEP 2141 further notes that the prior art reference (or references when combined) need not teach or suggest all the claim limitations. However, an obviousness-type rejection must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art. MPEP 2141 goes on to list exemplary rationales that may support a conclusion of obviousness. However, Applicant submits that the Official Action and the applied references present no objective evidence that would support an obviousness-type rejection of Applicant's amended claims based on one of these exemplary rationales.

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Michael E. Monaco, Reg. No. 52,041, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§ 1.16 or 1.147; particularly, extension of time fees.

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Respectfully submitted,

By ____________________

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